

Ethics and Impact of Computing

A Framework for Exam Questions

Social: How does computing affect people, relationships and society?

Ethical: Is the action morally right, fair and responsible?

Legal: What laws may apply to the situation?

Economic: How does computing affect jobs, businesses, productivity and costs?

Professional Ethics and Conduct

Principle	What it means	Example
Integrity	Be honest, impartial and trustworthy.	Do not claim skills you do not possess; protect confidential information; credit others' work.
Full responsibility	Accept responsibility for your work and its consequences.	Explain risks and consequences to an employer or client.
Competence	Maintain and improve relevant knowledge and skills.	Keep up to date with developments in computing and technology.
Professionalism	Maintain professional standards and use expertise responsibly.	Follow professional standards and use technical expertise responsibly.

Common Ethical Issues

Issue	Potential benefit	Ethical concern
Privacy & surveillance	Monitoring can improve security and convenience.	Excessive monitoring may intrude on privacy or reduce individual autonomy.
Bias & fairness	Automated decisions can be fast and consistent.	Biased data or algorithms may unfairly disadvantage particular groups.
Intellectual property	Protection encourages creation and innovation.	Using or copying another person's work without permission or credit may be unfair.
AI accountability	AI can improve services and productivity.	Responsibility may be unclear when an AI system causes harm or makes a poor decision.

Social Impact of Computing

Issue	Positive impact	Negative impact
Communication	Connects people and enables rapid sharing of information.	Can facilitate cyberbullying, harassment and unhealthy online behaviour.
Digital divide	Provides access to education, information and digital services.	People without access, devices or digital skills may be disadvantaged.
Health & well-being	Online communities and services can provide connection and convenience.	Excessive use may affect mental well-being and social interaction.
Accessibility	Assistive technologies can increase independence and participation.	Poorly designed systems may exclude users with disabilities.

Economic Impact of Computing

Issue	Positive impact	Negative impact
Automation	Increases efficiency, productivity and economic growth.	Routine or repetitive jobs may be displaced.
Employment & skills	Creates jobs in new technological fields.	Workers may need reskilling or upskilling as existing skills become obsolete.
Digital economy	Enables e-commerce and new business models.	Traditional businesses may face greater competition; inequality may widen.
Industry 4.0	Cloud computing, big data and networked machines can improve production.	Implementation can be costly and organisations unable to adapt may be disadvantaged.

Legal Issues: Laws to Recognise

Law	Think of...	Typical situation
Computer Misuse Act (CMA)	Unauthorised access or modification of computer material	Accessing another person's account or altering computer data without authorisation.
POFMA	Online falsehoods and manipulation	False statements of fact communicated online where the Act may apply.
POHA	Harassment, stalking and doxxing	Threatening or harassing someone online, unlawful stalking, or doxxing.
PDPA	Collection, use, disclosure and protection of personal data	An organisation handling information that identifies an individual.

Recognising CMA, POFMA and POHA

Computer Misuse Act (CMA)

Look for unauthorised access, use or modification of computer systems or data. Example: using another person's password to enter an account without permission.

POFMA - Protection from Online Falsehoods and Manipulation Act

Look for false statements of fact communicated online, especially where public-interest concerns arise.

POHA - Protection from Harassment Act

Look for threatening, abusive or insulting communications, harassment, unlawful stalking or doxxing.

PDPA: What Constitutes Personal Data?

Personal data is data about an individual who can be identified:

- from that data alone; or
- from that data together with other information that the organisation has or is likely to have access to.

Examples: name, NRIC number, mobile number, residential address, photograph, personal email address, or combinations of information that identify a person.

Key point: information does not have to identify someone by itself. A combination of data can constitute personal data.

PDPA: Data Protection Obligations (1-6)

Obligation	What it requires
1. Accountability	Take responsibility for personal data protection, including appropriate policies and a Data Protection Officer (DPO).
2. Notification	Inform individuals of the purposes for collecting, using or disclosing their personal data.
3. Consent	Obtain consent for the purposes for which personal data is collected, used or disclosed, subject to applicable exceptions.
4. Purpose Limitation	Collect, use or disclose personal data only for purposes that a reasonable person would consider appropriate.
5. Accuracy	Make reasonable effort to ensure personal data is accurate and complete where required.
6. Protection	Make reasonable security arrangements to protect personal data from unauthorised access, collection, use, disclosure and similar risks.

PDPA: Data Protection Obligations (7-11)

Obligation	What it requires
7. Retention Limitation	Stop retaining personal data, or remove the means of association with individuals, when it is no longer needed for a business or legal purpose.
8. Transfer Limitation	Transfer personal data overseas only in accordance with requirements that ensure a comparable standard of protection.
9. Access & Correction	Allow individuals, subject to the Act, to access their personal data and request correction of errors or omissions.
10. Data Breach Notification	Assess data breaches and notify the PDPC and affected individuals where the statutory notification criteria are met.
11. Data Portability*	Transmit applicable data to another organisation at an individual's request in accordance with the portability requirements.

** Data Portability is provided for in the PDPA but has not yet commenced; it takes effect when the relevant regulations are issued.*

PDPA: Quick Recognition Guide

If the scenario involves...	Think of...
An organisation collecting data without explaining why	Notification / Consent
Using personal data for an unrelated or inappropriate purpose	Purpose Limitation
Incorrect or outdated personal information	Accuracy
A database of personal data being exposed or accessed improperly	Protection / Data Breach Notification
Keeping personal data indefinitely without a valid reason	Retention Limitation
Sending personal data to an overseas service provider	Transfer Limitation
A person asking to see or correct their personal data	Access & Correction